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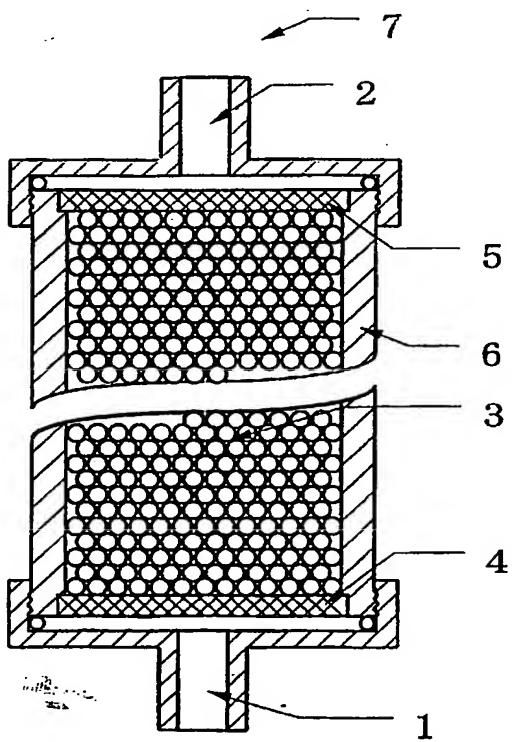
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(54) Title: LOW DENSITY LIPOPROTEIN/FIBRINOGEN ADSORBENT AND ADSORPTION APPARATUS CAPABLE OF WHOLE BLOOD TREATMENT

(54) 発明の名称: 全血処理が可能な低密度リポ蛋白およびフィブリノーゲンの吸着材、及び吸着器



(57) Abstract: An adsorbent, method of removing by adsorption or adsorption apparatus whereby low density lipoprotein and fibrinogen are effectively adsorbed directly from body fluid, especially whole blood to thereby obtain body fluid having the concentration thereof lowered without minimizing the loss of valuable substances such as HDL and albumin. In particular, an adsorbent comprising a water-insoluble porous support and, fixed thereon, a tryptophan derivative and a polyanionic compound, wherein the amount of polyanionic compound fixed is in the range of 0.10 to 1.5 μ mol per ml of adsorbent in wet form, and wherein the molar ratio between the amount of tryptophan derivative fixed and the amount of polyanionic compound fixed is in the range of 1 to 70. By the use of this adsorbent, low density lipoprotein and fibrinogen can be effectively adsorbed in a safe manner through whole blood treatment.

(57) 要約: HDL、アルブミンなどの有用物質を極力損失せず、体液、特に全血より直接低密度リポ蛋白およびフィブリノーゲンを効率よく吸着し、これらの濃度を低減させた体液を得るための吸着材、吸着除去方法、および吸着器を提供する。水不溶性多孔質担体にトリプトファン誘導体およびポリアニオン性化合物を固定化してなる吸着材であって、ポリアニオン性化合物の固定化量が湿潤体積の吸着材 1 ml 当たり $0.10 \mu\text{mol}$ 以上 $1.5 \mu\text{mol}$ 以下であり、かつトリプトファン誘導体の固定化量とポ

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リアニオン性化合物の固定化量のモル比が 1 以上 70 以下である吸着材が、全血処理により安全に低密度リポ蛋白およびフィブリノーゲンを効率よく吸着できる。



(81) 指定国(表示のない限り、全ての種類の国内保護が可能): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

SZ, TZ, UG, ZM, ZW), ユーラシア(AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), ヨーロッパ(AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

添付公開書類:
— 國際調査報告書

2文字コード及び他の略語については、定期発行される各PCTガゼットの巻頭に掲載されている「コードと略語のガイドスノート」を参照。

(84) 指定国(表示のない限り、全ての種類の広域保護が可能): ARIPO(BW, GH, GM, KE, LS, MW, MZ, SD, SL,

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/005953

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ A61M1/36

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ A61M1/02-1/36, B01D15/00-17/00, B01J20/00-20/34

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2004
Kokai Jitsuyo Shinan Koho	1971-2004	Toroku Jitsuyo Shinan Koho	1994-2004

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 7-136256 A (Asahi Medical Co., Ltd.), 30 May, 1995 (30.05.95), Par. Nos. [0001], [0004], [0007] to [0014] (Family: none)	1-5, 7-8
Y	JP 60-90039 A (Asahi Chemical Industry Co., Ltd.), 21 May, 1985 (21.05.85), Full text; all drawings (Family: none)	1-5, 7-8
A	JP 6-296859 A (Asahi Medical Co., Ltd.), 25 October, 1994 (25.10.94), Par. No. [0019] (Family: none)	1-5, 7-8

 Further documents are listed in the continuation of Box C. See patent family annex.

Special categories of cited documents:	
"A"	document defining the general state of the art which is not considered to be of particular relevance
"E"	earlier application or patent but published on or after the international filing date
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O"	document referring to an oral disclosure, use, exhibition or other means
"P"	document published prior to the international filing date but later than the priority date claimed
"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&"	document member of the same patent family

Date of the actual completion of the international search
26 July, 2004 (26.07.04)Date of mailing of the international search report
10 August, 2004 (10.08.04)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/JP2004/005953

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 5-269203 A (Asahi Chemical Industry Co., Ltd.), 19 October, 1993 (19.10.93), Full text; all drawings (Family: none)	1-5, 7-8
A	JP 2001-316420 A (Fresenius HemoCare GmbH.), 13 November, 2001 (13.11.01), Full text; all drawings & EP 1132129 A1 & US 2002/28888 A1	1-5, 7-8
A	JP 63-115572 A (Kaneka Corp.), 20 May, 1988 (20.05.88), Full text; all drawings & EP 265924 A2 & US 5015423 A	1-5, 7-8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/005953

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 6

because they relate to subject matter not required to be searched by this Authority, namely:

The invention as set forth in claim 6 pertains to methods for treatment of the human body by therapy and thus relates to a subject matter which this International Searching Authority is not required, under the provisions of Article 17(2) (a) (i) of (continued to extra sheet)

2. Claims Nos.:

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

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Continuation of Box No.II-1 of continuation of first sheet (2)

the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.